S T A T E O F M I C H I G A N

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

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In the matter, on the Commission's own motion, to review the response of **CONSUMERS ENERGY COMPANY** and **DTE ELECTRIC COMPANY** to recent storm damage in their service territories.	)))))	Case No. U-18346

At the August 23, 2017 meeting of the Michigan Public Service Commission in Lansing, Michigan.

PRESENT: Hon. Sally A. Talberg, Chairman
Hon. Norman J. Saari, Commissioner
Hon. Rachael A. Eubanks, Commissioner

ORDER

On March 28, 2017, the Commission issued an order in Case No. U-18346 (March 28 order), directing Consumers Energy Company (Consumers) and DTE Electric Company (DTE Electric) to each file a report detailing the company's response to power outages in its service areas that occurred as a result of the March 2017 wind storm. The wind storm was reported to be the largest combined statewide electric outage in Michigan's history. The wind storm, with gusts over 60 miles per hour, was unique in its intensity, duration, and geographic distribution. Consumers describes the weather conditions in its service area:

> On Tuesday morning, March 7, 2017, a strong low pressure system entered Ontario and resided there into Wednesday, March 8, 2017. This area of low pressure induced strong westerly flow that brought three periods of high winds over the state of Michigan. Thunderstorms appeared along the cold front, which brought 40-55 [miles per hour] mph gusts into mostly western and northern Michigan on Tuesday morning. On Wednesday, there was a secondary period of strong winds (40-53

mph) followed by widespread damaging winds (50-65 mph) across Lower Michigan.
Consumers' report, p. 5.

DTE Electric reports that, in addition to wind speeds equivalent to tropical storms, the storm was unusual because the ground was saturated due to heavy rains and snow, leading to the uprooting of trees. There was extensive damage to the electric system resulting from this intense storm. DTE Electric's report, p. 5. At times, approximately one-third of Michigan residents were affected by the power outage. While the large majority of customers had electric service restored in the first few days, there were some customers without power for more than a week.

The safety and reliability of electricity is an important priority for the Commission. Accordingly, in its March 28, 2017 order, the Commission sought information from the utilities to understand their response to the storm and to identify lessons learned. Key questions posed by the Commission were: (1) how the wind storm affected the utilities' distribution systems; (2) how the utilities prepared for and responded to the storm; (3) whether any changes could be implemented to reduce the potential for future power outages of the same magnitude; (4) whether the utilities were properly prepared to receive and respond to customer calls to report outages and if the utilities' customer communications were adequate; (5) whether the utilities sufficiently addressed all public safety concerns associated with downed power lines in a timely manner; (6) the accessibility of outage maps and how that could be improved; and (7) the performance of smart meters and other online communications. On May 15, 2017, the companies filed their reports. Following the March storm, the Commission Staff (Staff) and the staff of the Michigan Agency for Energy (MAE) met to discuss and document observations and lessons learned from this event. MAE report, p. 3. On July 11, 2017, MAE filed its comments regarding overall preparation and response to the March storm. On August 3, 2017, Consumers responded to MAE's comments. On

August 8, 2017, DTE Electric filed a response to MAE's comments. The Commission Staff contributed its own observations and recommendations, as well.

March Storm's Effect on the Utilities' Distribution Systems

Consumers reports that the March storm caused significant customer outages amounting to a cumulative total of 358,000, the equivalent of 20% of Consumers' 1.8 million electric customers. The vast number of customer outages ranks 15th in the utility's 130-year history and was an all-time combined record for Michigan residents. Counties with over 10,000 affected customers each were Kent, Jackson, Genesee, Kalamazoo, Barry, Lenawee, Barry, Calhoun, Ionia, Saginaw, and Allegan. Consumers asserts that the total estimated cost for the restoration is $33 million and the estimated insurance potential recovery is between $11 and $18 million. *Id.*, pp. 5-8.

Consumers states that 11,671 hazards and equipment replacements required removal or repair by field resources, including 91,000 feet of damaged wire conductor. Its high voltage distribution system (HVD) experienced "17 line lock outs and 15 line trip and recloses. Fifteen lines were forced from service to perform repairs identified during the post-storm assessments, including two that had locked out and seven that had tripped and reclosed." *Id.*, pp. 9-10. Overall, the HVD had 16 damaged poles, 15 damaged cross arm assemblies, 1downed guy wire, 2 downed ground wire, and 1 damaged conductor tie. 14 trees fell onto HVD wires. *Id.*, p. 10. *See,* Figure 5. Consumers' low voltage distribution system (LVD) suffered 845 damaged cross arms, approximately 799 damaged poles, and 236 damaged transformers. LVD hazards included 5,906 downed wires and 3,835 trees on lines. *Id*., *See*, Figure 4.

DTE Electric reports that storm and ground conditions (*i.e.*, sustained high winds and saturated ground) led to a higher than usual number of healthy trees being uprooted and falling across lines, as well as a higher than typical number of snapped utility poles. DTE Electric determined that

approximately 750,000 customers overall were without power in its service areas, making it the largest weather-related outage in the utility's history. DTE Electric's single-customer outages (5,500) were more than quadruple the number that occurs in most catastrophic storms. The high winds affected a disproportionate number of DTE Electric's customers due to the area's very high population density in Macomb county, northeastern Wayne county and pockets in Livingston, Oakland, St. Clair, and Washtenaw counties. Storm damage occurred across lower mid-Michigan and western mid-Michigan. DTE Electric's report, pp. 5-6, 11-12. *See*, Figure 2.

DTE Electric reports that "required repairs included replacing 1,285 utility poles and 1.1 million feet of wire. Nearly 11,000 total reports of downed wire came through on the Company's call center and mobile app." DTE Electric's report, p. 14.

Utilities' Preparation and Response to the March Storm

The Staff comments that each utility engages in ongoing storm preparation and response planning as a regular part of its business operations. In this instance, discussion will focus on preparations that were undertaken when weather reports seemed to indicate that the March storm was imminent. The Staff also notes that each company makes extensive use of meteorologist and weather service reports. Both companies participated in State Emergency Operations Center (SEOC) activities. Consumers' report, pp. 37-38; DTE Electric's report, p. 16.

Consumers indicates that, on March 6, one day prior to the advent of the March storm, it conducted a pre-planning conference call with operations and support leadership. Prior to the call, the utility placed its field crews on alert and requested extended evening coverage of forestry crews. Also on March 6, Consumers requested that office staff and leadership begin 24-hour monitoring of storm progress and damage for the purpose of deploying crews to areas most in need and to facilitate emergency management coordination with local organizations. Two additional

HVD crews were placed on call. Critical material inventories were confirmed and maintenance needs for vehicles and equipment were validated. Media releases were prepared, including postings to the utility's social media sites. Technical staff monitored and assessed the utility's computer system so as to provide optimal access to customers. Requests for mutual assistance field crews were made early on March 8. Consumers' report, pp. 11-13.

Throughout the storm and post-storm, Consumers continued to rely on its Incident Command System (ICS) and map-based Outage Management System (OMS) to delineate job responsibilities and organizational structure, identify areas of need, communicate information to customers, and assign and manage resources to address downed wires and restore power outages in an efficient and timely manner. The utility reports these systems assisted in managing as many as 480 line crews and 185 forestry crews. On March 8 and March 9, Consumers restored service to a total of approximately 235,000 customers, with restoration and electric hazard removal being prioritized by the utility. Consumers continued to provide frequent media releases to regular media outlets and social media sites. Consumers' report, pp. 7, 13-20, 29-30, 38, 48.

DTE Electric reports it prepared for the storm by securing and mobilizing field crews to areas of need, and by ensuring that contracted trucks and personnel, as well as supplies, were available near areas of expected activity. Field crews included 420 DTE Electric linemen and apprentices, 270 regular daily contractor linemen, 640 regular daily tree trim resources and, from the Great Lakes Mutual Assistance program (GLMA), 1,070 contract linemen and 500 tree trimmers. 134 electricians from the International Brotherhood of Electrical Workers (IBEW) Local 58 were called upon to do needed work. Additional employees from across the utility were also mobilized for the storm effort. DTE Electric sought to prepare timely, accurate, and transparent media releases to regular media outlets and social media sites. Call center staffing was maximized and

the Interactive Voice Response (IVR) was opened to its full capacity. DTE Electric communicated with and coordinated relevant activities with area community assistance organizations. The utility states that, all told, approximately 2,500 DTE Electric employees and 2,000 non-DTE Electric employees participated in the storm effort, nearly 3,000 of which were in the field. DTE Electric's report, pp. 9-17, 19.

DTE Electric deployed available utility employees and contractors to guard downed wires, eliminate known hazards, and restore power. Downed wires were given the highest priority for repair, with restoration of power to critical customers such as hospitals and police departments being the second highest. DTE Electric then worked to restore circuits with the highest number of customer outages. The utility coordinated its efforts with schools and with community aid organizations to meet customer needs for shelter. Continuous media updates were conducted. Technical staff worked to turn off all nonessential computer functions so that customers could communicate through the company website. DTE Electric's report, pp. 6, 14-16, 19-22.

Potential Improvements to Storm Response

Consumers identifies a number of areas with improvement potential. The company notes that areas where tree trimming and cutting had taken place suffered fewer tree-related outages and it plans to continue its vegetation management program. The utility also reports that it will continue to invest in improvements to the reliability of its distribution system, including pole replacements, line rebuilds, and automated fault isolation devices. There are plans to integrate its advanced meter infrastructure (AMI) devices with its outage management systems. Consumers' report, pp. 22-25, 47-48.

DTE Electric reports a number of areas where improvement can be accomplished. The company indicates its plan to accelerate its Enhanced Tree Trimming Program (ETTP) and

continue installation of sectionalizing devices such as reclosers and switches to increase circuit automation. DTE Electric also plans to install pole top line sensors and an integrated control system. Further integration of its AMI, as well as replacement of aging equipment, is expected to reduce the time customers are without power. DTE Electric's report, pp. 8, 27-29.

MAE comments that changes in restoration prioritization could have a positive influence on the availability of crucial petroleum infrastructure and that raising the level of prioritization for elementary schools could enhance the safety of at-risk children. MAE suggests that "special requests" from parties with lower prioritization should be discouraged and minimized. MAE's report, pp. 8-9.

Adequacy of Technology to Receive and Respond to Customer Communications

Consumers reports that it released four media updates per day, coinciding with typical news broadcast times, that included: (1) the total number of customers without power; (2) the total number of crews in the field; (3) the total number of downed poles/wires; (4) safety tips; and (5) information regarding the Consumers' online outage map. In addition, the company responded to 150 media inquiries and participated in on-air media interviews and news conferences with Governor Snyder. Targeted informational e-mails were sent to both business and residential customers. The utility's website was routinely updated. Post-storm customer feedback revealed that on-line messages worked better than all other channels; message content should reflect current restoration information about specific geographic areas; and customer satisfaction declined after the first two days of the storm. Consumers' report, pp. 28-32.

DTE Electric reports that it used a four-pronged approach in its customer outreach and communications: (1) timely and accurate communications with customers; (2) constant communication with government and emergency agencies; (3) thorough and continuous media

relations and social media communication; and (4) steady cadence of updates to the Commission. DTE Electric's report, pp. 14-15.

DTE Electric sought to achieve these goals through maximized staffing at call centers and opening its IVR to its full capacity. Its report notes that call volumes, peaking at 30,000 calls per hour, caused its systems to slow down in its processing of calls and events. The utility's technical staff worked around the clock to remedy the slow down and turn off all nonessential website functions. These measures, as well as limiting website traffic to emergencies only, resulted in improved company response to customer contacts. DTE Electric released numerous media updates, participated in media interviews, and provided customers with specific messages regarding outage status. The company notes that customer sentiment appeared to be positive or neutral from March 8 through the Sunday following the storm, after which the tone shifted to reflect frustration in the prolonged outages. DTE Electric report, pp. 14-18.

MAE suggests that there are several areas in which customer communications regarding outages might be improved. For example, MAE opines that utility reporting could be aligned with the twice daily SEOC briefings, and the Commission Staff should update its communication procedures and e-mail addresses. MAE asserts that DTE Electric should have an employee~~,~~ trained in and dedicated to emergency response, to staff the SEOC during energy-related emergencies. MAE suggests that the utilities investigate the possibility of an electronic interface with utility outage management systems or websites to automatically update outage numbers in the Michigan State Police (MSP) Critical Incident Management System. MAE's report, pp. 3, 7-8.

The Commission observes that both utilities made strong efforts to effectively utilize both traditional media outlets and social media to communicate with customers regarding outage status and progress toward restoration of service. However, customer preferences for emergency and

crisis communication and information updates are rapidly evolving as demonstrated by the post-storm feedback Consumers received and a 400% increase in customer inquiries over the past four years. Consumers' report, pp. 36-37, 52. Accordingly, the Commission agrees that increased focus should be placed on expedited and frequent electronic and social media communications. Also, it is unclear whether customers in the DTE Electric service territory were aware that, where the AMI outage reporting system was partially on-line on March 8, their AMI meters were automatically reporting their outages and phone call or website reporting was unnecessary. Now that Consumers' AMI outage reportage system is also on-line, the Commission encourages both utilities to perform outreach to their customers outside of storm situations to inform them of these capabilities. Utilizing AMI technology should alleviate some of the incoming data overload on the utilities' call centers or outage maps. Finally, the Commission notes that customers experienced frustration when restoration estimates were excessively inaccurate. DTE Electric notes that the highest number of complaints occurred after more than six consecutive days of outage (DTE Electric's report, p. 18); however, the number of customers impacted by these extended outages were proportionally low at 10% of total outages and were due to extremely complicated or difficult to access system damage. DTE Electric also notes that these outages were largely single-customer in nature. The Commission finds that additional individualized outreach to customers experiencing over six days of outages are needed to ensure customer safety and mitigate frustration in complex situations.

The Commission agrees with MAE's suggestion regarding timing utility updates to align with the SEOC briefings and for DTE Electric to dedicate employees to staff the SEOC during energy-related emergencies. With respect to MAE's recommendation on utility reporting of outage

information in the MSP Critical Incident Management System, the Commission recommends continued discussion among the Staff, MAE, and utilities on this topic.

Public Safety Concerns Associated With Downed Power Lines

Consumers reports that when evaluating a downed line, a qualified employee determines that all phases of an upstream device are open and the hazard is either removed or qualified personnel are posted at the site to keep the public away. In addition to dispatching its own trained staff, the company trains office employees as "wire guards" and "wire evaluators" to identify and guard downed wire hazards. During the March storm, numerous field and office personnel were dedicated to securing downed wires. Average response time to downed wire reports was 949 minutes. Company communications with the media and on its website included safety information about downed wires. In addition, Consumers is implementing a downed wire task force to significantly increase the number of trained resources. Consumers' report, pp. 19-20, 28.

DTE Electric reports that, during the storm, it also dedicated numerous in-office and field staff to resolve downed line hazards, with each report being investigated. Lines deemed to be a hazard were either cut and removed or taped and barricaded. The utility also created intentional service interruption at substation breakers where a downed line was detected on the 4.8 kilovolt (kV) system. Safety messages were broadcast hourly on local radio stations and repeated on the utility's website and social media accounts. DTE Electric's report, pp. 19-20.

The Commission observes that each utility attempted to a prompt response to downed wire hazards and effectively communicated safety information to the public. The Commission notes that DTE Electric reports there were statistically fewer outages and downed lines in areas where enhanced vegetation management had taken place. DTE Electric's report, p. 27. The vegetation management programs are, in part, based on a new vegetation management initiative, approved

and funded in rate cases decided in 2015.[1] It appears that continued progress in vegetation management will likely reduce outages from trees and limbs falling onto lines. The utilities should continue these programs with guidance from the Commission. In addition, the Commission encourages Consumers to train more field resources, fully implement ICS, and provide increased cross-functional restoration processes such as the utility discusses on pages 22 and 23 of its report.

Outage Map Accessibility and Effectiveness

Consumers reports that it gave customers access to a full website version and a mobile version of its outage map. The map contains multiple views broken down into specific geographic areas. At the time of the March storm, the program's usage capacity was 300 requests per second. During the March storm, excessive demand (at one point, 61 times more "views" than on a normal traffic day) resulted in a substantial performance degradation. Users reported waiting three to five minutes to see results on Consumers' web page. The utility reports that since the March storm, it has improved its map by reducing the number of automatic map refreshes, and by adding reliability metrics. Consumers' report, pp. 43-47.

DTE Electric reports that although it maximized call center staffing and improved voice recognition capacity for calls in advance of the storm, its website was still inaccessible for a 24-hour period. In response, nonessential functions were eventually disabled in order to prioritize outage map inquiry traffic (DTE Electric's report, p. 15); however, this caused frustration for customers at a critical point of trying to reach the utility.

The Commission encourages Consumers and DTE Electric to develop plans for further upgrades to their outage map systems in order to provide critical information to their customers in

[1] *See*, the November 19, 2015 order Case No. U-17735, pp. 54-59, 137, ordering paragraph J, and the December 11, 2015 order in Case No. U-17767, pp. 25-27, 137-138, ordering paragraph E.

a timely manner. In particular, to better accommodate incoming website requests, the Commission agrees with DTE Electric's approach that nonessential functions should be immediately disabled as soon as possible when website usage rates are highest in the first hours after the storm to better accommodate incoming website requests. In addition, the proactive customer communications related to the capabilities of AMI in outage reporting previously discussed should assist with this issue.

Performance of Smart Meter and Other On-line Communication

Both utilities identified opportunities to enhance the capabilities of AMI, including smart meters and other technologies. Consumers' report, pp. 47-48; DTE Electric's report, p. 28. The Commission is aware that smart meters, as well as line and pole-top communication devices and other technology, are in the early stages of implementation and not fully integrated with each utility's outage management system. However, increased use of communicating devices would appear to be advantageous in locating downed wires, honing in on areas of service outage, and returning customers to service in a more efficient manner. MAE reports that AMI technology has the capacity to be used by emergency personnel to check on vulnerable customers during outage periods. MAE's report, p. 10. Also, usage of AMI allows for storm crews to be more efficiently allocated to storm damage remediation and not to manually check on outages. In turn, service restoration is expedited. Consumers estimates that it eliminated 1,500 unnecessary "truck rolls" to check on customers who were already restored. Consumers' report, p. 52. Accordingly, DTE Electric and Consumers should expedite the integration of their systems.

Summary

The March 2017 wind storm was unique and caused tremendous damage to the utilities' electric distribution systems. From all accounts, the utility line crews, contractors, and support

staff worked safely on round-the-clock shifts to complete restoration efforts. The Commission finds that each company made good faith, diligent efforts to prepare for and respond to the power outages and damage caused by the storm. Each utility relied on available technology to learn of and respond to downed wire hazards, to obtain and deploy crews and equipment to areas in need, and to communicate through social media and other means of dangers and progress toward restoration of service to customers. Each utility cooperated and coordinated emergency activities with the Commission, SEOC, and Governor Snyder. Both relied on a standardized, prioritized schedule of power restoration and hazard removal. Both utilities emphasized work and public safety programs such as guarding downed wires, assisting with vulnerable customers, instituting safe work practices by employees and outside crews, and communicating public safety messages.

Advanced planning such as weather monitoring, staging of crews and equipment, mobile units, AMI installations, and mutual aid arrangements also contributed to the utilities' storm preparedness and response. Notably, improved vegetation management practices implemented by each company appeared to result in fewer outages on circuits that were affected by the new practices.

Even so, areas where improvement is desired and/or needed were identified by each company, as well as by the Staff and MAE. The Commission identifies four areas for improvement. First, AMI technology assisted the utilities with outage detection and prioritization during the March storm, but both utilities are still in the process of fully integrating AMI with their outage management software systems and other functions. The Commission stresses the importance of completing such integration efforts in a successful and timely manner in order to ensure the AMI investment meets its full potential to assist with customer communications related to outage status and restoration estimates, enhance emergency activities for vulnerable customers, particularly

during extreme weather conditions and/or extended outages, and improve the detection of and response to outages. This is an important tool to improve the customer experience and to reduce the amount of time that customers are without power.

Second, the utilities are strongly encouraged to continue their commitment to tree trimming (vegetation management) and to evaluate its impact on the frequency and duration of outages. This will assist the Commission in assessing vegetation management programs in rate cases and how such programs can affect safety and reliability. Michigan will continue to see strong storms regardless of the time of year, and tree trimming is an essential activity to mitigate the impacts of such storms.

Third, the Commission stresses the importance of the ongoing efforts by Consumers and DTE Electric to develop long-term capital and operations plans for their electric distribution systems.[2] These plans are essential to prioritize infrastructure improvements through a transparent process with specific goals (*e.g.*, safety, reliability), metrics (*e.g.*, system average interruption duration (SAIDI), customer average interruption duration (CAIDI), and system average interruption frequency (SAIFI)), associated timelines, and investment strategies. While it is not likely feasible for the plans now under development, in the future, the utilities should assess the undergrounding of equipment to determine if the benefits outweigh the costs in certain applications. The Commission assessed the economics and performance issues of undergrounding distribution equipment in a 2007 study (Case No. U-15279), but an update may be warranted.

Fourth, the Commission stresses the importance of utility communication programs that enable two-way information exchange with customers. We are reminded that, with a storm of this

[2] *See*, the January 31, 2017 order in Case No. U-18014, and the February 28, 2017 order in Case No. U-17990.

magnitude, storm restoration programs include more than the field work from the individuals called upon to rebuild parts of the electric distribution system. Customers expect access from their utility to accurate information about the status of their electric service and restoration times.

Finally, the Commission appreciates the work crews, including many from out-of-state, who worked tirelessly in difficult conditions to restore power to customers, as well as the utilities' efforts to coordinate with state and local partners.

THEREFORE, IT IS ORDERED that Consumers Energy Company and DTE Electric Company shall work in conjunction with Commission Staff to explore and expedite potential improvements and changes to each company's storm preparation and response, consistent with the findings and recommendations discussed in this order.

The Commission reserves jurisdiction and may issue further orders as necessary.

MICHIGAN PUBLIC SERVICE COMMISSION

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Sally A. Talberg, Chairman

By its action of August 23, 2017.

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Norman J. Saari, Commissioner

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Kavita Kale, Executive Secretary

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Rachael A. Eubanks, Commissioner